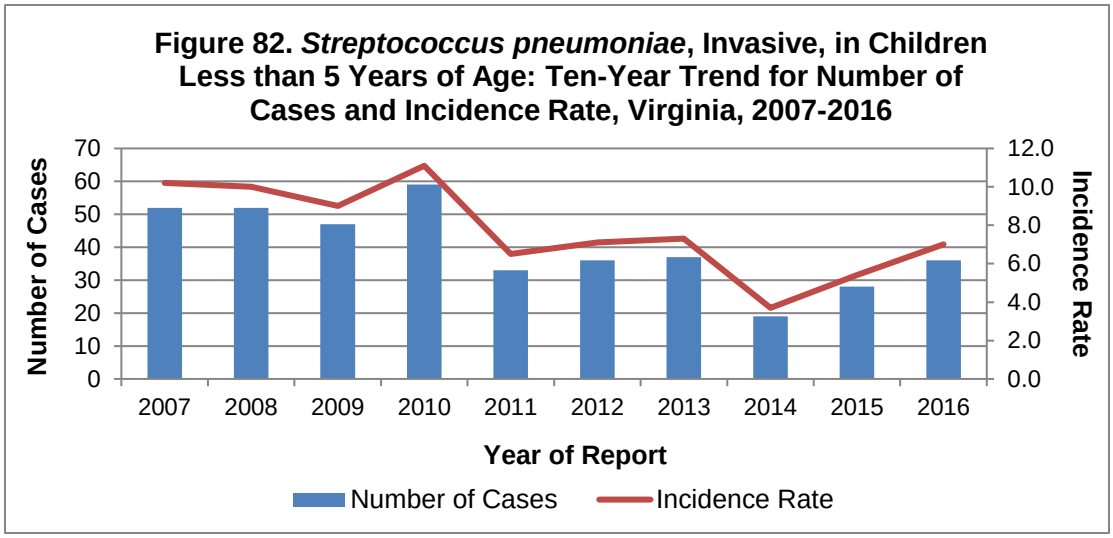
Streptococcus pneumoniae, Invasive, in Children Less than 5 Years of Age

Agent: *Streptococcus pneumoniae* (bacteria)
Mode of Transmission: Person-to-person transmission via respiratory droplets or direct contact with respiratory secretions from persons carrying the bacteria in their upper respiratory tract.
Signs/Symptoms: Invasive pneumococcal disease (IPD) may affect the blood, lung, and lining of the brain and spinal cord and may cause fever, chills, and irritability. Headache, stiff neck, confusion, sleepiness, vomiting, and poor feeding can occur with meningitis.
Prevention: Routine immunization with pneumococcal conjugate vaccine as a 4-dose series is recommended for infants at 2, 4, 6, and 12 to 15 months of age. IPD can be hard to treat because of antibiotic resistance, thus making prevention through vaccination even more important. The 7-valent conjugate vaccine was first licensed in the U.S. in 2000 and was replaced with a 13-valent vaccine that was licensed in 2012. Following the introduction of the 13-valent vaccine, clients that completed the immunization series were recommended to receive a booster dose for protection against the additional strains. Clients two years of age and over with certain high-risk conditions are also recommended to receive one dose of a 23-valent polysaccharide vaccine following series completion with pneumococcal conjugate vaccine. Vaccination with 13-valent followed by 23-valent polysaccharide vaccine is also recommended for adults aged 65 years or older, and other persons at increased risk for infection.
Other Important Information: There are more than 90 known serotypes of *S. pneumoniae*. Although all serotypes can cause serious disease, a relatively limited number of serotypes cause the majority of invasive infections. From 1998 (two years before implementation of routine immunization of infants with 7-valent pneumococcal conjugate vaccine) through 2007, incidence of vaccine-type invasive pneumococcal infections decreased by 99% in children less than 5 years of age, and the incidence for all pneumococcal infections decreased by 76%. Today, *S. pneumoniae* continues to be the leading cause of bacterial meningitis among children less than 5 years of age in the United States.

***Streptococcus pneumoniae*, Invasive, in Children Less than 5 Years of Age: 2016 Data Summary**	
Number of Cases:	36
5-Year Average Number of Cases:	30.6
% Change from 5-Year Average:	+18%
Incidence Rate per 100,000:	7.0

Thirty-six cases of invasive *S. pneumoniae* were reported in children less than five years of age in Virginia during 2016. This represents an 18% increase from the five-year average of 30.6 cases per year. This increase may be part of a cyclical trend as seen from 2011 to 2013 (Figure 82). Statewide, the incidence rate for invasive *S. pneumoniae* in children less than five years of age for 2016 was 7.0 cases per 100,000 population.*****



Incidence rates were higher in children aged less than one year (16.5 cases per 100,000) compared to those aged 1-4 years (4.6 cases per 100,000). Race information was not reported for 25% of cases. Among those with a known race, the highest incidence rate was observed in the black population with 6.6 cases per 100,000, followed by the white population (4.8 cases per 100,000) and "other" population (4.7 cases per 100,000). Males had a higher incidence rate than females (7.6 and 6.4 cases per 100,000, respectively).

Two regions were at or above the statewide incidence rate of 7.0 per 100,000. The northwest region had an incidence rate more than double the statewide rate with 14.7 cases per 100,000, while the southwest region had an incidence rate of 7.2 cases per 100,000. The remaining three regions had incidence rates ranging from 6.4 to 3.7 cases per 100,000. Cases followed a seasonal trend of occurring in colder months with 33% of cases occuring in the fourth quarter and 28% of cases occuring in the first quarter of the year. Remaining cases were evenly split at 19% each in the second and third quarters. No deaths were directly attributed to *S. pneumoniae* during 2016. Hospitalization was common as 28 cases (78%) were hospitalized in 2016.

*** All incidence rates have been adjusted to reflect the population less than five years of age.**